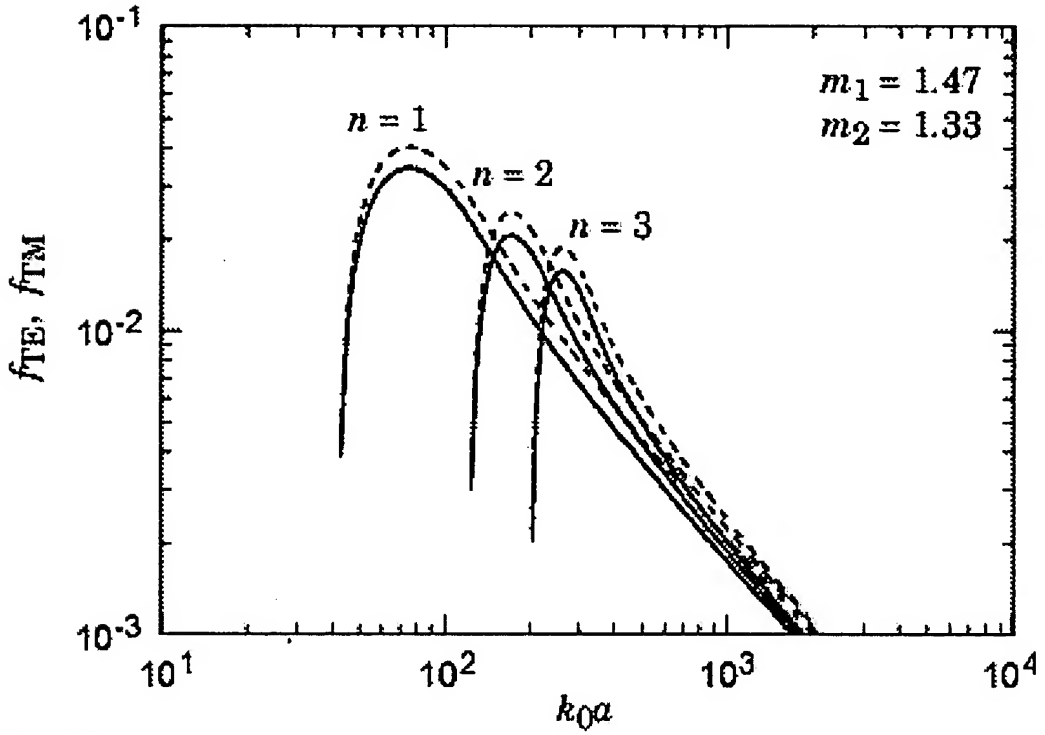

FIGURE 1

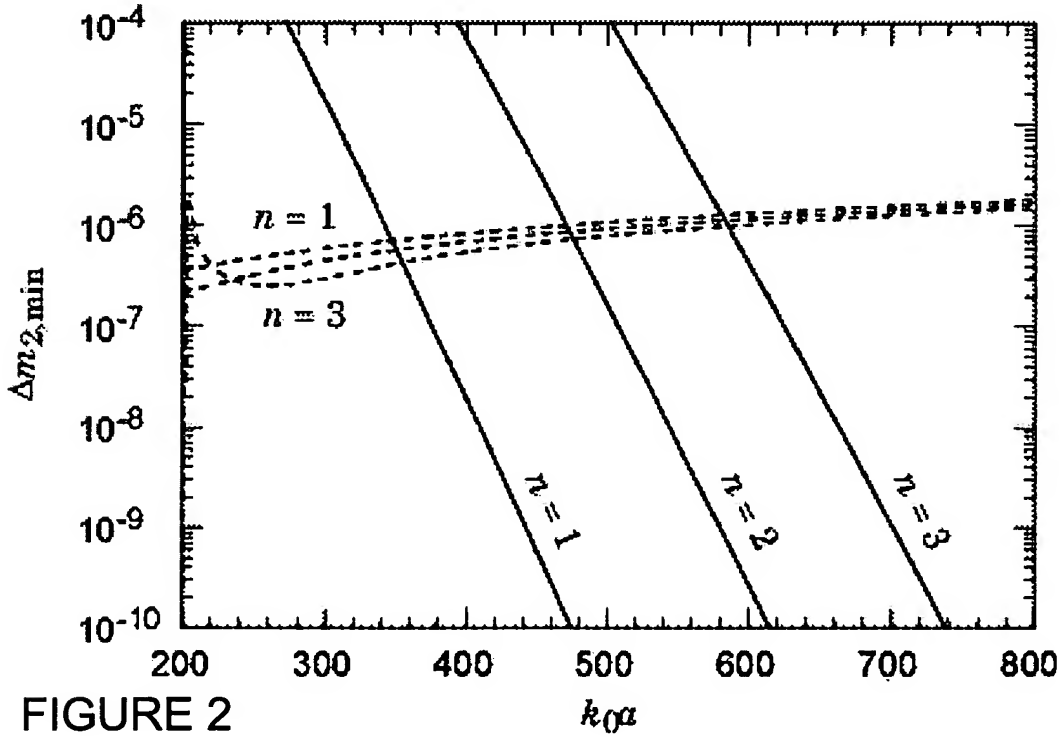

FIGURE 2

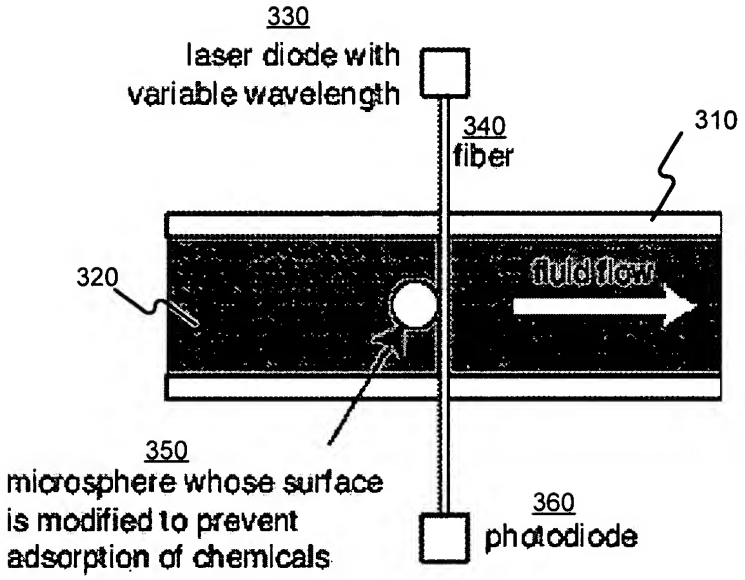
330
laser diode with
variable wavelength
340
fiber
310
320
fluid flow
350
microsphere whose surface
is modified to prevent
adsorption of chemicals
360
photodiode

FIGURE 3

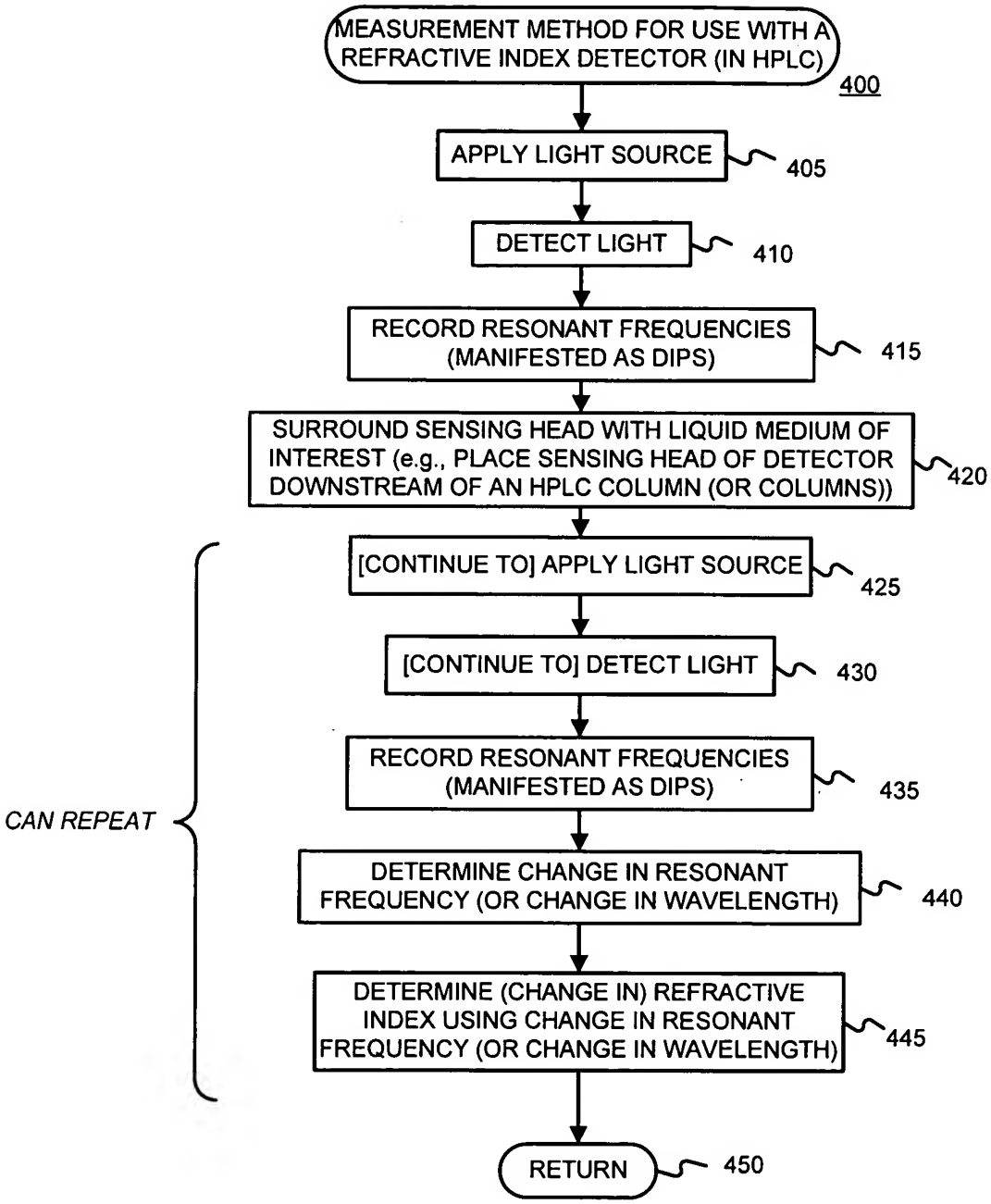
MEASUREMENT METHOD FOR USE WITH A REFRACTIVE INDEX DETECTOR (IN HPLC)
400
APPLY LIGHT SOURCE
405
DETECT LIGHT
410
RECORD RESONANT FREQUENCIES (MANIFESTED AS DIPS)
415
SURROUND SENSING HEAD WITH LIQUID MEDIUM OF INTEREST (e.g., PLACE SENSING HEAD OF DETECTOR DOWNSTREAM OF AN HPLC COLUMN (OR COLUMNS))
420
[CONTINUE TO] APPLY LIGHT SOURCE
425
[CONTINUE TO] DETECT LIGHT
430
RECORD RESONANT FREQUENCIES (MANIFESTED AS DIPS)
435
DETERMINE CHANGE IN RESONANT FREQUENCY (OR CHANGE IN WAVELENGTH)
440
DETERMINE (CHANGE IN) REFRACTIVE INDEX USING CHANGE IN RESONANT FREQUENCY (OR CHANGE IN WAVELENGTH)
445
CAN REPEAT
RETURN
450

FIGURE 4

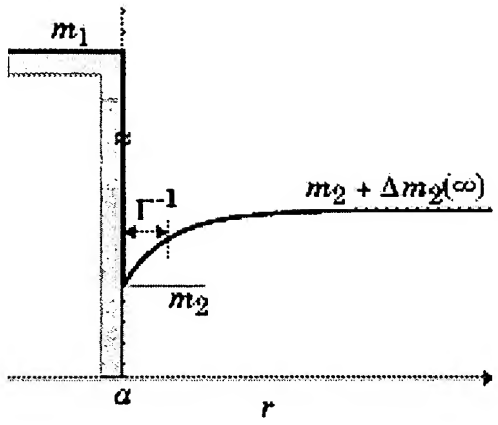

FIGURE 5

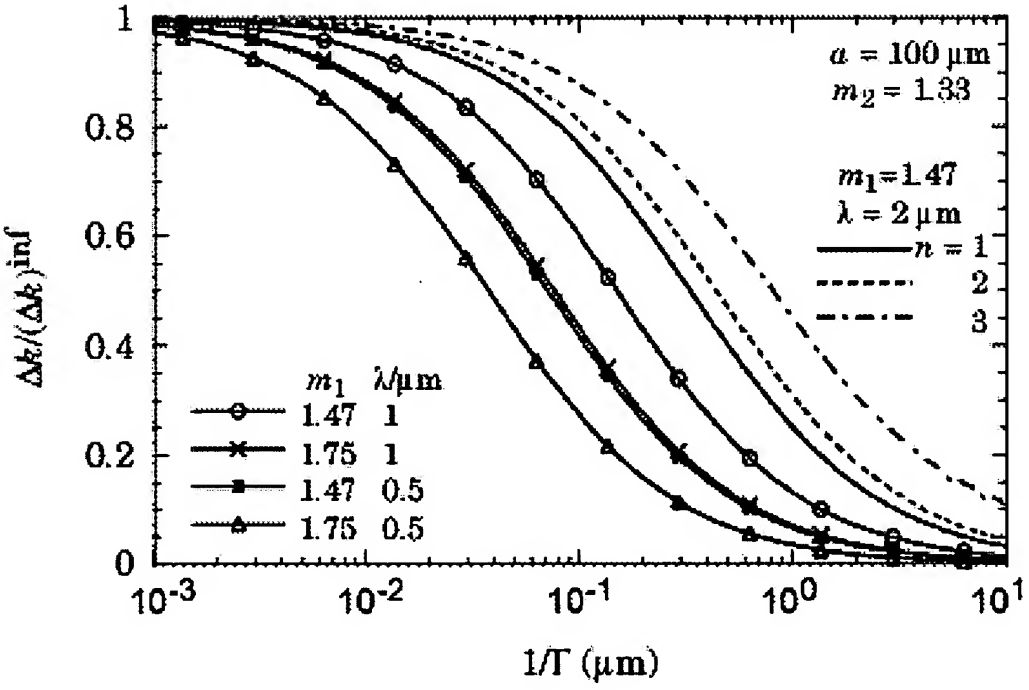

FIGURE 6

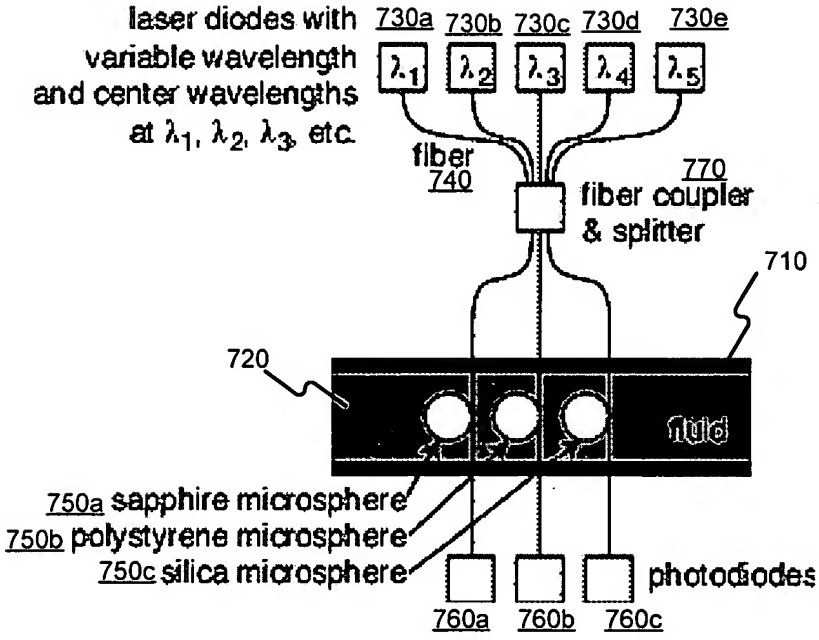
laser diodes with variable wavelength and center wavelengths at λ_1, λ_2, λ_3, etc.
730a
730b
730c
730d
730e
λ_1
λ_2
λ_3
λ_4
λ_5
fiber 740
770
fiber coupler & splitter
710
720
fluid
750a sapphire microsphere
750b polystyrene microsphere
750c silica microsphere
photodiodes
760a
760b
760c

FIGURE 7

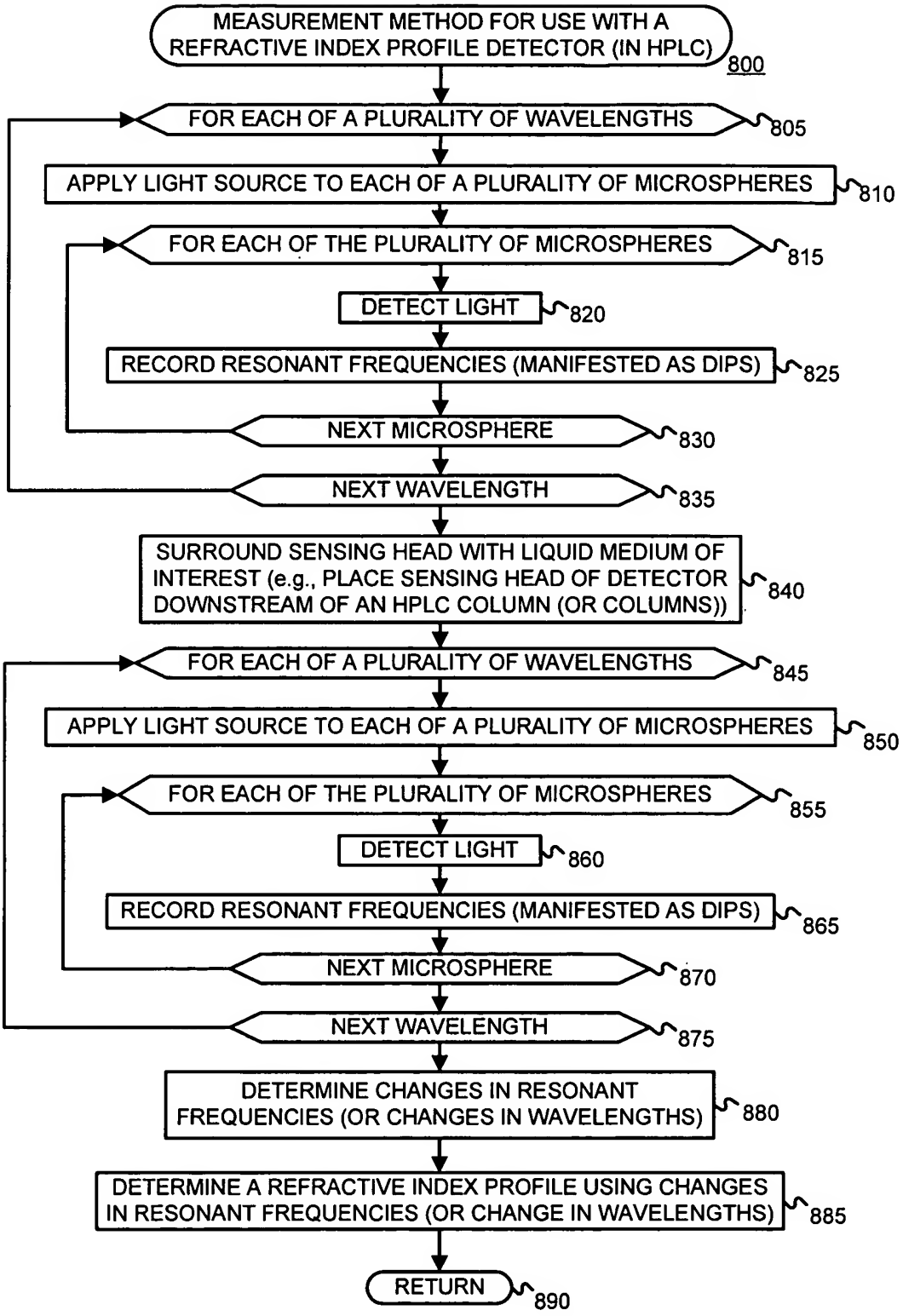
MEASUREMENT METHOD FOR USE WITH A REFRACTIVE INDEX PROFILE DETECTOR (IN HPLC)
800
FOR EACH OF A PLURALITY OF WAVELENGTHS
805
APPLY LIGHT SOURCE TO EACH OF A PLURALITY OF MICROSPHERES
810
FOR EACH OF THE PLURALITY OF MICROSPHERES
815
DETECT LIGHT
820
RECORD RESONANT FREQUENCIES (MANIFESTED AS DIPS)
825
NEXT MICROSPHERE
830
NEXT WAVELENGTH
835
SURROUND SENSING HEAD WITH LIQUID MEDIUM OF INTEREST (e.g., PLACE SENSING HEAD OF DETECTOR DOWNSTREAM OF AN HPLC COLUMN (OR COLUMNS))
840
FOR EACH OF A PLURALITY OF WAVELENGTHS
845
APPLY LIGHT SOURCE TO EACH OF A PLURALITY OF MICROSPHERES
850
FOR EACH OF THE PLURALITY OF MICROSPHERES
855
DETECT LIGHT
860
RECORD RESONANT FREQUENCIES (MANIFESTED AS DIPS)
865
NEXT MICROSPHERE
870
NEXT WAVELENGTH
875
DETERMINE CHANGES IN RESONANT FREQUENCIES (OR CHANGES IN WAVELENGTHS)
880
DETERMINE A REFRACTIVE INDEX PROFILE USING CHANGES IN RESONANT FREQUENCIES (OR CHANGE IN WAVELENGTHS)
885
RETURN
890

FIGURE 8